NGUYEN Quang-Duy

1 0000-0002-3517-0945

(+33) 7 53 97 25 47

□ quang-duy.nguyen@cea.fr

@ https://w3id.org/people/quang-duy.nguyen/

"I may stutter in speaking, but not in philosophizing, inventing, and empathizing."



Education

2017 – 2020 PhD in Computer Science

École Doctorale des Sciences Pour l'Ingénieur, University Clermont-Auvergne, France UR TSCF, MathNUM departement, INRAE (Irstea), Clermont-Ferrand, France

Funding : Scholarship from the region Auvergne-Rhône-Alpes and FEDER

PhD defense: 16/07/2020

2014 – 2015 Master 2 in Computer Networking

University Claude Bernard Lyon I, France

Funding: (1) Scholarship AUF-IFI; (2) Grant from IdEx of University of Strasbourg

Note: 15.31/20.00 - Rank: 1/60

2013 – 2014 Master 1 in Computer Science

Institut de la Francophonie pour l'Informatique (IFI), Vietnam National University, Hanoi

Funding: Scholarship AUF-IFI

Note: 14.20/20.00

2007 – 2012 Engineer of Information Technology in Computer Engineering

Hanoi University of Science and Technology, Vietnam

Note: 14.96/20.00

Experience

12/2021 – present **Postdoctoral Researcher** \rightarrow **Researcher**

LSEA laboratory, DILS department, CEA List, Palaiseau, France

Project: (1) LocalSEA; (2) CoGeFlux; (3) OTPaaS; (4) List Tech Days: F&3D DTs; (5) APS: INTEROP; (6) TARGET-X: Ros6GBUSBridge; (7) RAASCEMAN Keywords: Industry 4.0/5.0, AAS, Papyrus, Manufacturing, Testbed, ROS 1/2

10/2020 - 09/2021 Postdoctoral Researcher

LTCI laboratory, INFRES department, Télécom Paris, Palaiseau

Project : OPC UA PubSub for Caméléon

Keywords: IIoT, SNCF, OPC UA, Embedded System, Zephyr OS, Node-RED, C

01/2017 - 07/2020 **PhD Student**

UR TSCF, MathNUM departement, INRAE

Project : (1) ConnecSens; (2) AgroTechnoPôle

Keywords: Agriculture, IoT, Ontology, Reasoning, OWL, SWRL, Java, Python

08/2016 - 10/2016 Research Engineer

Programmation, Networks and Systems team, LaBRI laboratory, Bordeaux, France

Project : Le Palais de la Mémoire

Keywords: Sounds, Method of Loci, Beacons, BLE, Android, Java

04/2015 - 07/2016 Master 2 Intern \rightarrow Research Engineer

Networks team, ICube laboratory, Strasbourg, France

Project : FIT/IoT-lab

Keywords: Multihoming, Mobility, Contiki, TelosB, Python, C/C++

Publications*

- [CI.12] Quang-Duy Nguyen, and Saadia Dhouib, "Lessons from Developing AAS Digital Twins for Factory Buildings with Papyrus4Manufacturing", Proceedings of the 3rd IEEE Industrial Electronics Society Annual Online Conference (ONCON), Virtual, 12/2024
- [CI.11] Quang-Duy Nguyen, Yining Huang, Guéréguin Der Sylvestre Sidebe, and Saadia Dhouib, "From Multiple Digital Twins to a Multi-Faceted Digital Twin: Towards an AAS-Based Approach", Proceedings of the 29th International Conference on Emerging Technologies and Factory Automation (ETFA), Padova, Italy, 09/2024
- [CI.10] Quang-Duy Nguyen, Saadia Dhouib, Eric Lucet, Antoine Le Mortellec, and Fabien Baligand, "Bridging the Gap between IT and OT with AAS Digital

Twins and MDE Techniques: An Industrial Waste Management Case Study", Proceedings of the 29th International Conference on Emerging Technologies and Factory Automation (ETFA), Padova, Italy, 09/2024

[JI.4] Quang-Duy Nguyen, Yining Huang, François Keith, Christophe Leroy, Minh-Thuyen Thi, and Saadia Dhouib, "Manufacturing 4.0: Checking the Feasibility of a Work Cell Using Asset Administration Shell and Physics-Based Three-Dimensional Digital Twins", MDPI Machines, 01/2024

- [JI.3] Fadwa Rekik, Saadia Dhouib, and **Quang-Duy Nguyen**, "Bridging the Gap between SysML and OPC UA Information Models for Industry 4.0", Journal of Object Technology, 07/2023
- [CI.9] Quang-Duy Nguyen, Saadia Dhouib, Yining Huang, and Patrick Bellot, "An Approach to Bride ROS 1 and ROS 2 Devices into an OPC UA-based Testbed for Industry 4.0", Proceedings of the 1st IEEE Industrial Electronics Society Annual Online Conference (ONCON), Virtual, 12/2022
- [CI.8] Quang-Duy Nguyen, Saadia Dhouib, and Patrick Bellot, "A Unified Method to Design Bridges for OPC UA PubSub Networks in the Industrial IoT", Proceedings of the 27th IEEE International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD), Paris, France, 11/2022
- [CI.7] Quang-Duy Nguyen, Saadia Dhouib, Kunal Suri, and Fadwa Tmar, "From Requirement Specification to OPC UA Information Model Design: A Product Assembly Line Monitoring Case Study", Proceedings of the 20th IEEE International Conference on Industrial Informatics (INDIN), Perth, Australia, 07/2022
- [CI.6] Quang-Duy Nguyen, Patrick Bellot, and Pierre-Yves Petton, "An OPC UA PubSub Implementation Approach for Memory-Constrained Sensor Devices", Proceedings of the 31st IEEE International Symposium on Industrial Electronics (ISIE), Anchorage, United States, 06/2022
- [CI.5] Quang-Duy Nguyen, Fadwa Tmar, Yining Huang, and Saadia Dhouib, "Early Lessons Learned from the Development of a Local OPC UA-based Robotic Testbed for Research", Proceedings of the 31st IEEE International Symposium on Industrial Electronics (ISIE), Anchorage, United States, 06/2022
- [CI.4] Quang-Duy Nguyen, Saadia Dhouib, Jean-Pierre Chanet, and Patrick Bellot, "Towards a Web-of-Things Approach for OPC UA Field Device Discovery in the Industrial IoT", Proceedings of the 18th IEEE International Conference on Factory Communication Systems (WFCS), Pavia, Italy, 04/2022
- [CI.3] Quang-Duy Nguyen, Catherine Roussey, Patrick Bellot, and Jean-Pierre Chanet, "Stack of Services for Context-Aware Systems: An Internet-Of-Things System Design Approach", Proceedings of the 15th IEEE International Conference on Computing and Communication Technologies (RIVF), Hanoi, Vietnam, 08/2021
- [<u>T.1</u>] **Quang-Duy Nguyen**, "Interoperability and Upgradability Improvement for Context-Aware Systems in Agriculture 4.0", PhD thesis, University Clermont-Auvergne, France, 2020
- [JI.2] Julian Eduardo Plazas, Sandro Bimonte, Christophe de Vaulx, Michel Schneider, **Quang-Duy Nguyen**, Jean-Pierre Chanet, Hongling Shi, Kun Mean Hou, and Juan Carlos Corrales, "A Conceptual Data Model and its Automatic Implementation for IoT-Based BI Applications: UML Profile and MDA Approach", IEEE Internet of Things Journal, 10/2020

Citations: 90 H-index: 6 I-index: 5

Summary

ltems classified by domains:
loT (8), OPC UA (7),
Ontology (5), AAS (4)
ltems classified by SJR:
Q1 (1), Q2 (2),
Q3 (0), Q4 (1)
Scopus-indexed Items: 17

ISI-indexed Items: 11

2/3

[CF.2] Quang-Duy Nguyen, Catherine Roussey, Maria Poveda-Villalón, Christophe de Vaulx, Jean-Pierre Chanet, and Camille Noûs, "CASO et IRRIG deux ontologies pour le développement de systèmes contextuels: cas d'usage sur l'automatisation de l'irrigation", Actes des 31es journées francophones d'Ingénierie des Connaissances (IC), Angers, France, 07/2020

[JI.1] Quang-Duy Nguyen, Catherine Roussey, Maria Poveda-Villalón, Christophe de Vaulx, and Jean-Pierre Chanet, "Development Experience of a Context-Aware System for Smart Irrigation using CASO and IRRIG ontologies", Special Issue "Semantic Technologies Applied to Agriculture", MDPI Applied Sciences, 03/2020

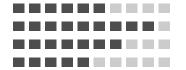
[CI.2] Maria Poveda-Villalón, **Quang-Duy Nguyen**, Catherine Roussey, Christophe de Vaulx, and Jean-Pierre Chanet, "Ontological Requirement Specification for Smart Irrigation Systems: A SOSA/SSN and SAREF Comparison", Proceedings of the 9th International Semantic Sensor Networks Workshop (SSN) of the 17th International Semantic Web Conference (ISWC), Monterey, United States, 10/2018

[CF.1] Maria Poveda-Villalón, **Quang-Duy Nguyen**, Catherine Roussey, Christophe de Vaulx, and Jean-Pierre Chanet, "Besoins ontologiques d'un système d'irrigation intelligent : Comparaison entre SSN et SAREF", Actes des 29es journées francophones d'Ingénierie des Connaissances (IC), Nancy, France, 07/2018

[CI.1] Quang-Duy Nguyen, Julien Montavont, Nicolas Montavont, and Thomas Noël, "RPL Border Router Redundancy in the Internet of Things", Proceedings of the 15th International Conference on Ad-Hoc Networks and Wireless (ADHOC-NOW), Lille, France, 07/2016

Research Skills

Project Management
System Implementation
Scientific Writing
Presentation



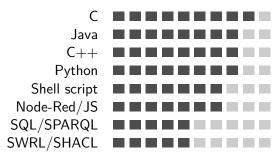
Linguistic

Technical Skills

Standard OPC UA, AAS, RAMI 4.0, ISA-95
IT Network TCP/IP, UA PubSub, MQTT, REST
OT Network Profinet, MODBUS, UA FX
Cybersecurity AES-CTR, TLS, JWT
OS/Middleware Linux, Zephyr, BaSyx, ROS2
Methodology Mini-Waterfall, LOT, Agile, MDE
Vocabulary SOSA/SSN, CASO, IRRIG

Tool Papyrus, Protégé, Wireshark, UaExpert

Programming



References

- **Prof. Patrick BELLOT**, Director of the CCN team of LTCI, INFRES department, Télécom Paris Direct supervisor in the project "OPC UA PubSub for Caméléon"

 ☑ patrick.bellot@telecom-paris.fr
- **Dr. Jean-Pierre CHANET**, Director of UR TSCF, MathNUM department, INRAE

 Director of the thesis "Interoperability and Upgradability Improvement for Context-Aware Systems in Agriculture 4.0"

 ☑ jean-pierre.chanet@inrae.fr